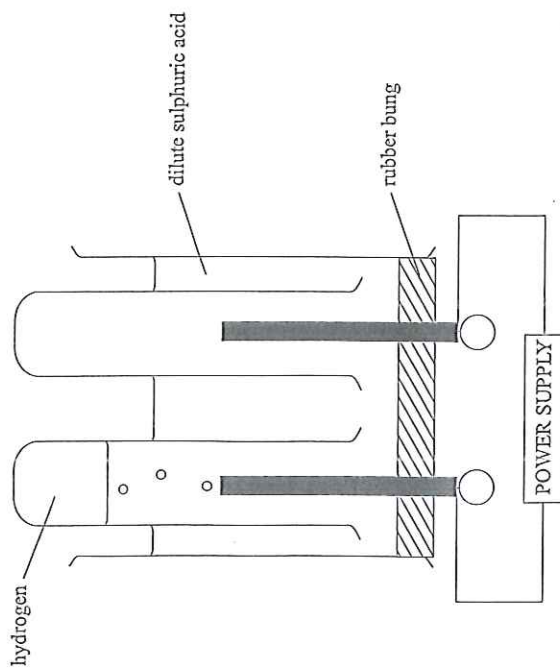


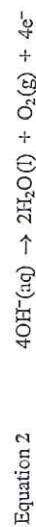
Nov 07

11. The diagram shows apparatus that can be used to electrolyse dilute sulphuric acid.



(a) (i) Label the electrodes in the diagram by writing the symbols + and - in the circles. (1)

(ii) The equations for the reactions occurring at the electrodes are



Give the formula of the species being reduced.
Give a reason for your choice.

Species

Reason

(2)

Leave blank

Leave blank

(iii) The volume of hydrogen gas collected after a few minutes is shown on the diagram.

Draw another line on the diagram to show the volume of oxygen gas collected after the same length of time.
Explain your choice with reference to Equations 1 and 2.

.....
.....
..... (3)

(b) In one experiment, the amount of charge passed was 0.40 faraday.

(i) Calculate the amount, in moles, of hydrogen gas formed.

(1)

(ii) Calculate the volume, in dm^3 , of this amount of hydrogen gas at room temperature and pressure (rtp).
(Molar volume of any gas = 24 dm^3 at rtp)

(2)

(c) In a second experiment, the amount of charge passed was 0.80 faraday.

(i) Calculate the amount, in moles, of oxygen formed.

(1)

(ii) Calculate the mass, in g, of oxygen formed.

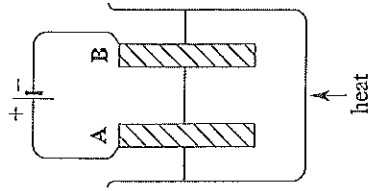
(2)

(Total 12 marks)

Q11

May 05 -

8. The diagram shows the apparatus used to electrolyse lead(II) bromide.



(a) The wires connected to the electrodes are made of copper.

Explain why copper conducts electricity.

.....
.....
(1)

(b) Explain why electrolysis does not occur unless the lead(II) bromide is molten.

.....
.....
(2)

(c) The reactions occurring at the electrodes can be represented by the equations shown in the table.

Complete the table to show the electrode (A or B) at which each reaction occurs, and the type of reaction occurring (oxidation or reduction).

Electrode reaction	Electrode	Type of reaction
$Pb^{2+} + 2e^{-} \rightarrow Pb$		
$2Br^{-} \rightarrow Br_2 + 2e^{-}$		

(2)

(d) In an experiment using the same apparatus, the amount of charge passed was 0.10 faraday.

(i) Calculate the maximum amount, in moles, of each substance formed.

Amount of Pb
Amount of Br_2 (2)

(ii) Calculate the mass of bromine formed.

.....
.....

(2) Q8
(Total 9 marks)

Leave blank

Leave blank

(Total 5 marks)

Q4

(2)

Electrode	Name of product	Equation for reaction
positive	Lead	$\text{Pb}^{2+} + \dots \rightarrow \text{Pb}$
negative		$2\text{Br}^- - 2e^- \rightarrow \text{Br}_2$

(c) Complete the table showing what happens at the electrodes in diagram B.

(1)

(b) What is the name of the process that occurs in diagram B?

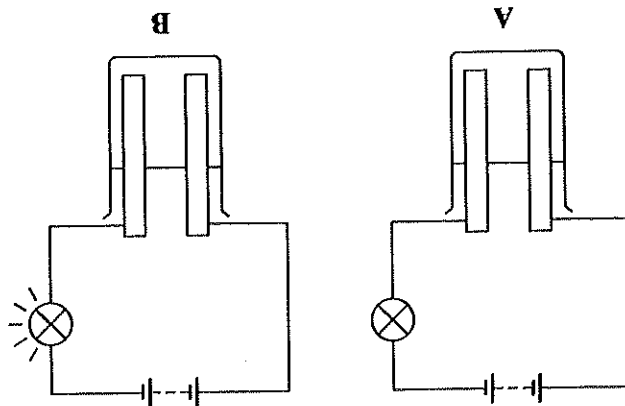
(1)

- A Lead bromide only contains ions when it is molten
 B Solid lead bromide is a covalent compound
 C When lead bromide is molten the ions can move about
 D Metals like lead are good conductors of electricity

(ii) Which of the following is the best explanation for your observation? Draw a ring around the letter of your answer.

(1)

(a) (i) What difference do you observe between diagrams A and B?



4. The following diagrams show what happens when an electric current was passed through lead bromide (PbBr_2). In diagram A the lead bromide is solid while in diagram B it is molten.

Leave blank

Specimen